11:15

705-4 Idiopathic Right Ventricular Outflow Tract Tachycardia: Narrowing the Anatomic Location for Successful Ablation

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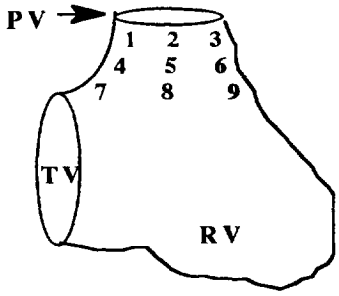
Pace-mapping is the primary technique used to localize the origin of ventricular tachycardia (VT) from the right ventricular outflow tract (RVOT). We previously divided the RVOT septum into 9 equal sites (see figure) and developed a surface ECG algorithm for identifying the 9 paced sites based on the orientation of the QRS complex in leads I and aVL and the precordial R wave progression. Based on this algorithm and initial experience with catheter ablation of RVOT-VT, we hypothesized that most RVOT-VTs originate from a limited area in the RVOT, corresponding to the mid to anterior and superior RVOT septum just below the pulmonic valve (sites 2 & 3). To test this hypothesis, we documented fluoroscopically the site of identical pace-maps and successful radiofrequency (RF) catheter ablation of RVOT-VT in 14 consecutive patients (12 female; ages 23–66 years). All patients presented with palpitations and/or presyncope and left bundle branch block/inferior VT with a right (n = 5) or left (n = 9) axis. Each patient had a structurally normal heart. A lesion was considered successful if no tachycardia could be induced with atrial or ventricular pacing (± isopreterenol) after having been reproducibly initiated prior to lesion application. *Result:* In each patient, the site of best pace-map and successful ablation was site 2 or 3 (The figure represents a right anterior oblique view of the right ventricle:



Conclusion: In most patients with RVOT-VT, the site of successful RF catheter ablation was in the mid to anterior and most superior aspect of the RVOT septum. These findings may simplify the approach to RF catheter ablation of RVOT-VT and thus decrease fluoroscopic exposure in these patients.

11:30

705-5 Comparison of Radiofrequency Lesions in the Canine Left Ventricle Using a Saline Irrigated Electrode Versus Temperature Control

Hiroshi Nakagawa, William S. Yamanashi, Jan V. Pitha, Khek C. Yong, Mauricio Arruda, Michael Rome, Xanzhang Wang, Ken-ichiro Ohtomo, Ralph Lazzara, Warren M. Jackman. *University of Oklahoma, Oklahoma City, OK; DVAMC, Oklahoma City, OK*

The maximum power deliverable by present radiofrequency (RF) ablation systems is limited by an impedance rise which occurs when the temperature at the electrode-tissue interface reaches 100°C. The limitation in power limits the depth and diameter of the lesion. The present method to avoid an impedance rise and maximize power delivery utilizes a thermistor in the ablation electrode. The power is varied to maintain a target temperature and prevent the temperature from exceeding 90–95°C (temperature control approach-TC). An alternative approach utilizes saline irrigation of the ablation electrode (active cooling) to prevent an impedance rise at high power (IR approach). The purpose of this study was to compare LV lesion size produced by the IR and TC approaches. In 15 anesthetized dogs (18–22 kg), a 7F deflectable catheter with a lumen and 5 mm tip electrode containing a thermistor and 6 Irrigation holes (located radially, 1 mm from tip) was inserted into a carotid artery and advanced to the LV under fluoroscopic guidance. RF current was applied at one site by manually controlling voltage (30–80 V) to maintain the electrode temperature at 80–90°C (TC) and at a second site using saline irrigation (60 ml/min) and constant voltage of 90V (IR). In 3 additional dogs with remote myocardial infarction (3–6 months), a total of 4 RF lesions was made at the border of the scar, all by IR approach (IR MI). The 15 dogs were sacrificed 6 days after ablation and the 3 dogs with infarction were sacrificed 4 hours after ablation.

Results:

	n	Voltage (V)	Power (W)	Imp Rise	Elect temp (°C)	Lesion Depth	Diameter (mm)
TC	15	57 ± 13	36 ± 17	3/15	84 ± 3	9.3 ± 2.0	12.7 ± 2.4
IR	15	90 ± 0*	88 ± 8*	6/15	38 ± 4*	12.1 ± 2.4*	20.5 ± 2.8*
IR MI	4	90 ± 0	81 ± 10	3/4	36 ± 3	8.6 ± 1.0	16.0 ± 2.4

*p < 0.01; TC vs. IR

All impedance rises occurred after >30 seconds and with electrode temperature <80°C and an audible pop, suggesting release of steam from below the endocardial surface instead of boiling at the electrode-tissue interface.

Conclusions: 1) Electrode cooling by saline irrigation allows sustained RF energy at high power; producing larger and deeper lesions in normal LV myocardium; 2) the deeper lesions with a cooler electrode suggests direct resistive heating occurs relatively far from the electrode; and 3) reasonable lesions can be obtained in infarcted LV using irrigation.

11:45

705-6 Post-Infarct Ventricular Tachycardia: Success Rate of Catheter Ablation

Steven A. Rothman, Henry H. Hsia, Sergio F. Cossú, Lisa M. Thome, Nancy M. Adelizzi, Deborah M. Whitley, Alfred E. Buxton, John M. Miller. *Temple University School of Medicine, Philadelphia, PA*

Reports of catheter ablation (CA) of infarct-based ventricular tachycardia (VT) have generally targeted slow VTs of 1 morphology; success rates have been variable. We performed radiofrequency CA in 25 patients (pts) who presented with sustained uniform VT, with the intent of eliminating *all* inducible uniform-morphology VTs (not just "clinical" VTs). CA was performed during 94 distinct VTs; 65 of these (69%) could not be induced thereafter. In individual pts, success of CA was defined as complete (absence of any inducible uniform VT) or partial (elimination of some but not all VTs). Results among the 25 pts:

Success	n	#VTs/Pt	Procedure Time (min)	Recurrence
Complete	17 (68%)	3.0 ± 2.0*	320 ± 168	0 (0%)
Partial	5 (20%)	6.4 ± 4.0*	306 ± 175	5 (100%)
Failure	3 (12%)	3.7 ± 2.9	243 ± 119	1 (33%)
P value		0.03*	NS	0.001

Of the 17 pts with complete success, 10 received no other treatment, 5 had an implantable defibrillator and 2 pts remained on prior antiarrhythmic drugs. No clinical recurrences or implantable defibrillator discharges occurred in any of these pts after a mean follow-up of 6 ± 4 months. Follow-up stimulation 3 months later showed no inducible VT in 8/10 pts (80%) discharged without inducible VT. Of the 5 pts with partial success, 3 have had a marked decrease in frequency of VT recurrences. None of the documented recurrences was fatal. One pt with frequent episodes of stable VT for years had possible sudden death 2 months post CA (without symptoms in interim). The mean cycle length of successfully ablated VTs was 366 ± 74 ms vs 312 ± 51 ms for unsuccessfully ablated VTs ($p < 0.01$).

Conclusions: 1) Immediate and long term success can be achieved with aggressive radiofrequency CA in a majority of patients with sustained monomorphic VT post-infarct, even when multiple VT morphologies are present. 2) VTs with cycle length <400 ms can be successfully ablated but faster VTs are less easily ablated, not entirely related to hemodynamic tolerance.

706 Preconditioning and Stunning

Monday, March 20, 1995, 10:30 a.m.–Noon
Ernest N. Morial Convention Center, Room 61

10:30

706-1 Preconditioning Ischemia Time Determines the Degree of Glycogen Depletion and Infarct Size Reduction in Rat Hearts

Vania Barbosa, Richard E. Sievers, Christopher L. Wolfe. *University of California San Francisco, San Francisco, CA*

Infarct size reduction after ischemic preconditioning has been reported as an all-or-nothing response, with a threshold of 2 to 5 min of preconditioning ischemia time. Furthermore, infarct size reduction is associated with glycogen depletion before prolonged ischemia. We sought to determine whether increasing preconditioning ischemia time results in progressive myocardial glycogen depletion and infarct size reduction and if so, whether infarct size reduction correlates with glycogen depletion before prolonged ischemia. Therefore, ventilated rats underwent a single episode of preconditioning is-